## REMARKS

Claims 1 to 23 are pending in this application. Claims 1-18 have been rejected. Claims 19-23 are newly added herein.

The Rejection under 35 U.S.C. §112

Claims 1-18 are rejected under 35 U.S.C. §112, second paragraph as being indefinite. In particular, with respect to the preamble of Claim 1 the Office Action states that it is unclear how the dilute ethylene stream which is used for the alkylation is made. With respect to step (a) of Claim 1, the Office Action states that it in unclear how the dilate ethylene is added.

This rejection is respectfully traversed. Claim 1 states that the dilute ethylene stream is provided by liquefying and separating out a portion of the ethylene containing stream derived from the hydrocarbon cracking prior to directing the remainder of the ethylene-containing stream to the ethylene fractionator and/or by drawing off a side stream from the ethylene fractionator. Referring now to Figs. 1 and 2, it can be seen that the dilute ethylene stream fed to the alkylator (16 and 26, respectively) are provided by separating out a portion of the ethylene-containing streams (14, 24), condensing the portion and sending the condensed dilute ethylene stream (14b, 24a) to the alkylators (16, 26).

Alternatively, or in combination with the separation/condensation process described above, the separation/condensation process described above, the ethylene-containing stream can be directed to the ethylene fractionator and a slide stream drawn off from the fractionator and fed to the alkylator. These features are adequately described in the specification. One skilled in the art, upon reading the claims, would be clearly apprised of the scope of what is claimed by Applicants. Accordingly, Claim 1 meets the requirements of 35 USC § 112, second paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

The Rejection Under Prior Art

Claims 1-18 are rejected under 35 USC § 103(a) as being obvious over what the Office Action terms "admitted prior art" in view of U.S. Patent No. 5,602,290 (hereinafter, "Fallon"). Fallon discloses the pretreatment of dilute ethylene feedstocks for ethylbenzene production by an absorption process in which the dilute ethylene stream is contacted with an aromatic stream (e.g., benzene) to remove higher olefins. The so called "admitted prior art" relates only to directing an ethylene-containing stream to an ethylene fractionator for separating ethylene from ethane.

The rejection is respectfully traversed for the following reasons: (1) outside of Applicants' own specification there is no motivation provided within either of the references for their combination, and (2) even if these references were to be combined, Applicants' claimed invention would not be rendered obvious.

Firstly, it should be noted that even if it were technologically possible to combine the teachings of one reference with those of another, such combination would not be rendered obvious unless some motivation within the references suggested their combination. One cannot, using Applicants' own disclosure as a guide, engage in hindsight reconstruction by picking and choosing certain features of one reference with selected features of another to reproduce Applicants' claimed invention. See e.g., *In re Fritch*, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992; *In re Fine*, 5 USPQ 2d 1596 (Fed. Cir. 1988).

At page 3 the Office Action states, *inter alia*, the following:

> It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the admitted prior art by using a portion of the dilute ethylene stream before the ethylene/ethane fractionator and/or from a draw-stream of the fractionator as the alkylation feed since such a feed containing ethylene and an acceptable amount of ethane can be used as the alkylation feed as taught by Fallon.
>
> It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process by condensing the dilute ethylene stream to liquefy the alkylation stream to meet the condition of the alkylation reaction if the process is operated in the liquid phase.

However, neither Fallon nor the "admitted prior art" provide any motivation to one skilled in the art to practice Applicants' claimed invention. As stated in the specification, and recognized in the Office Action, an advantage of the present invention is to save capital and energy cost in the ethylene/ethane fractionation step by withdrawing some of the dilute ethylene from the effluent of the acetylene remover prior to the energy intensive ethylene/ethane fractionation step and using the withdrawn dilute ethylene to make ethylbenzene, a commercially valuable product. Fallon does not even disclose an ethylene/ethane fractionation process because all of the ethylene is sent to the alkylator 12 for complete conversion. Accordingly, the advantages achieved by Applicant's process are not even relevant to the Fallon process, much less suggested by it. Neither is there anything in the so called "admitted prior art" which would provide motivation to one skilled in the art to perform the process of the invention as claimed herein.

A rejection must be based upon the objective evidence of record. See, *In re Lee*, 61 USPQ 2d 1430, 1433 (Fed. Cir. 2002). Particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected components for combination in the manner claimed. See, *In re Kotzab*, 55 USPQ 2d 1313, 1317 (Fed. Cir. 2000). Deficiencies in the references cannot be remedied by conclusory statements. See, *In re Zurko*, 59 USPQ 2d 1693, 1697 (Fed. Cir. 2001).

The cited prior art does not support the assertions made by the Examiner nor does the Office Action provide any other references to valid prior art to support these assertions. As such, the Examiner must be employing the "common knowledge" exception as allowed by MPEP. 2144.03. Applicants respectfully disagree that it would have been common knowledge at the time the invention was made to divert a portion of the dilute ethylene stream to an alkylator prior to sending the remainder of the stream to an ethylene fractionator, or to employ a side stream from the ethylene/ethane fractionator as an alkylator feed. As allowed by the aforementioned section of the MPEP. Applicants respectfully request that the Examiner provide adequate proof for the assertions.

Secondly, Fallon does not make up for the deficiencies of the "admitted prior art"even if it were to be combined. In particular, Fallon does not disclose or suggest the separation of the dilute ethylene-containing stream into a portion which is sent to an ethylene/ethane fractionation column, and a portion which is sent to an alkylator. Nor does Fallon disclose or suggest drawing off a side stream from an ethylene/ethane fractionation column and feeding the side stream to an alkylator. As mentioned above, the entire absorption-treated ethylene-containing stream 24 of Fallon is sent directly to the alkylator 12. Even if the teachings of Fallon were to be combined with what the Office Action alleges to be Applicants' "admitted prior art", none of the pending claims would be suggested or disclosed by such combination.

Applicants also submit that the presently claimed invention is not mere optimization of an existing system. Rather, the invention, taken as a whole, involves a new arrangement of processing steps which provides substantial savings in operating costs, as evidenced in Examples 1 to 4 of the specification, by combining an ethylene plant with an ethylbenzene plant in the manner claimed herein.

Accordingly, it is respectfully submitted that the cited prior art does not support a *prima facie* case for obviousness. Reconsideration and withdrawal of the rejection are respectfully requested.

The New Claims

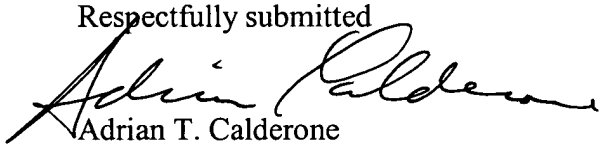
New Claims 19 to 23 are provided herein and are submitted to be allowable over the art of record.

In particular, Claims 19 and 21 are new independent claims. Claim 20 depends from Claim 19 and Claims 22 and 23 depend from Claim 21. Allowance of these claims is respectfully requested.

## CONCLUSION

For at least the reasons stated above all of the pending claims are submitted to be in condition for allowance, the same being respectfully requested.

Respectfully submitted



Adrian T. Calderone
Reg. No. 31,746
Attorney for Applicant(s)

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DILWORTH & BARRESE, LLP
333 Earle Ovington Blvd.
Uniondale, NY 11553
Tel: (516) 228-8484
Fax: (516) 228-8516